

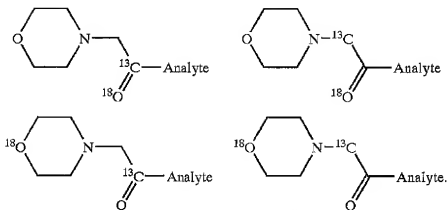
Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-41. (Canceled)

42. (Previously Presented and Withdrawn) A method comprising:

a) reacting two or more samples, each sample comprising one or more reactive analytes, with a different labeling reagent of a set of labeling reagents to thereby produce two or more differentially labeled samples each comprising one or more isobarically labeled analytes wherein the sample mixture comprises one or more isobarically labeled analytes of the formula:



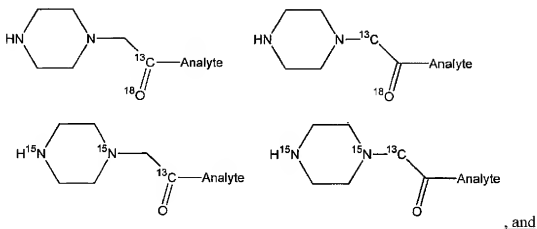
43. (Currently Amended) A method comprising:

a) ~~reacting~~ providing two or more samples, each sample comprising one or more reactive peptide analytes,

b) reacting a first sample of the two or more samples with a first labeling reagent of a set of isobaric labeling reagents.

c) reacting a second sample of the two or more samples with a second labeling reagent of the set of isobaric labeling reagents, the second labeling reagent differing isobarically from the first labeling reagent, wherein steps b) and c) with a different labeling reagent of a set of labeling reagents to thereby produce two or more differentially labeled samples each comprising one or more isobarically labeled peptide analytes,

d) mixing together the two or more differentially labeled samples to form a wherein the sample mixture comprises one comprising two or more isobarically labeled peptide analytes of the formula:



e) performing mass spectrometry on the sample mixture to analyze the isobarically labeled peptide analytes.

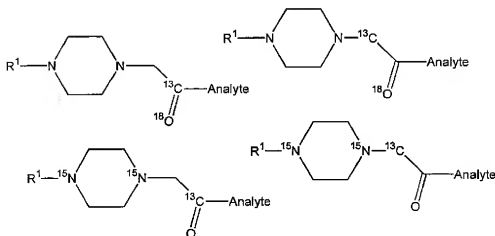
44. (Currently Amended) A method comprising:

a) reacting providing two or more samples, each sample comprising one or more reactive peptide analytes,

b) reacting a first sample of the two or more samples with a first labeling reagent of a set of isobaric labeling reagents,

c) reacting a second sample of the two or more samples with a second labeling reagent of the set of isobaric labeling reagents, the second labeling reagent differing isobarically from the first labeling reagent, wherein steps b) and c) with a different labeling reagent of a set of labeling reagents to thereby produce two or more differentially labeled samples each comprising one or more isobarically labeled peptide analytes,

d) mixing together the two or more differentially labeled samples to form a wherein the sample mixture comprises one comprising two or more isobarically labeled peptide analytes of the formula:



wherein each  $R^1$  is the same or different and is an alkyl group comprising one to eight carbon atoms which may optionally contain a heteroatom or a substituted or unsubstituted aryl group wherein the carbon atoms of the alkyl and aryl groups independently comprise linked hydrogen, deuterium and/or fluorine atoms, and

e) performing mass spectrometry on the sample mixture to analyze the isobarically labeled peptide analytes.

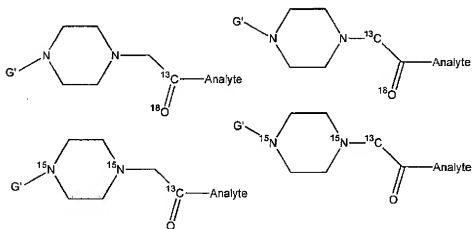
45. (Currently Amended) A method comprising:

a) reacting providing two or more samples, each sample comprising one or more reactive peptide analytes,

b) reacting a first sample of the two or more samples with a first labeling reagent of a set of isobaric labeling reagents,

c) reacting a second sample of the two or more samples with a second labeling reagent of the set of isobaric labeling reagents, the second labeling reagent differing isobarically from the first labeling reagent, wherein steps b) and c) with a different labeling reagent of a set of labeling reagents to thereby produce two or more differentially labeled samples each comprising one or more isobarically labeled peptide analytes,

d) mixing together the two or more differentially labeled samples to form a wherein the sample mixture ~~comprises one~~ comprising two or more isobarically labeled peptide analytes of the formula:



wherein:

a) G' is an amino alkyl, hydroxy alkyl or thio alkyl group comprising one to eight carbon atoms which may optionally contain a heteroatom or a substituted or unsubstituted aryl group

wherein the carbon atoms of the alkyl and aryl groups independently comprise linked hydrogen, deuterium and/or fluorine atoms;

b) each carbon of the heterocyclic ring has the formula  $CJ_2$ , wherein each J is the same or different and is selected from the group consisting of: H, deuterium (D),  $R^1$ ,  $OR^1$ ,  $SR^1$ ,  $NHR^1$ ,  $N(R^1)_2$ , fluorine, chlorine, bromine and iodine; and

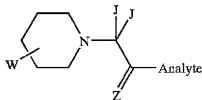
e) each  $R^1$  is the same or different and is an alkyl group comprising one to eight carbon atoms which may optionally contain a heteroatom or a substituted or unsubstituted aryl group wherein the carbon atoms of the alkyl and aryl groups independently comprise linked hydrogen, deuterium and/or fluorine atoms, and

e) performing mass spectrometry on the sample mixture to analyze the isobarically labeled peptide analytes.

46-103. (Canceled)

104. (Currently Amended) A mixture comprising at least two labeled peptide analytes, wherein each of the two labeled peptide analytes originates from a different sample combined to form the mixture and each ~~comprise an~~ comprises a different isobaric label from a same set of isobaric labels, each isobaric label comprising ~~that is~~ a 5, 6, or 7 membered heterocyclic ring comprising a ring nitrogen atom that is N-alkylated with a substituted or unsubstituted acetic acid moiety to which the peptide analyte is linked through the carbonyl carbon of the N-alkyl acetic acid moiety, wherein each different isobaric label comprises one or more heavy atom isotopes.

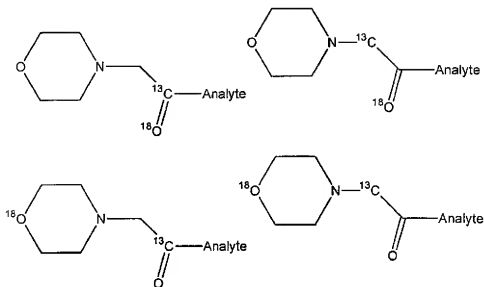
105. (Currently Amended) The mixture of claim 104, wherein each of the at least two labeled analytes in the mixture ~~comprise~~ comprises the formula:



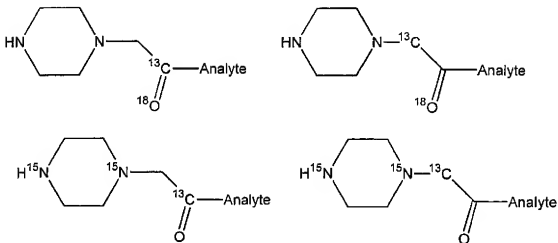
wherein;

- a) Z is O, S, NH or  $\text{NR}^1$ ;
- b) each J is the same or different and is H, deuterium (D),  $\text{R}^1$ ,  $\text{OR}^1$ ,  $\text{SR}^1$ ,  $\text{NHR}^1$ ,  $\text{N(R}^1)_2$ , fluorine, chlorine, bromine or iodine;
- c) W is an atom or group that is located ortho, meta or para to the ring nitrogen and is  $\text{NH}$ ,  $\text{N-R}^1$ ,  $\text{N-R}^2$ ,  $\text{P-R}^1$ ,  $\text{P-R}^2$ , O or S;
- d) each carbon of the heterocyclic ring has the formula  $\text{CJ}_2$ ;
- e) each  $\text{R}^1$  is the same or different and is an alkyl group comprising one to eight carbon atoms which may optionally contain a heteroatom or a substituted or unsubstituted aryl group wherein the carbon atoms of the alkyl and aryl groups independently comprise linked hydrogen, deuterium and/or fluorine atoms; and
- f)  $\text{R}^2$  is an amino alkyl, hydroxy alkyl, thio alkyl group or a cleavable linker that cleavably links the reagent to a solid support wherein the amino alkyl, hydroxy alkyl or thio alkyl group comprises one to eight carbon atoms, which may optionally contain a heteroatom or a substituted or unsubstituted aryl group, and wherein the carbon atoms of the alkyl and aryl groups independently comprise linked hydrogen, deuterium and/or fluorine atoms.

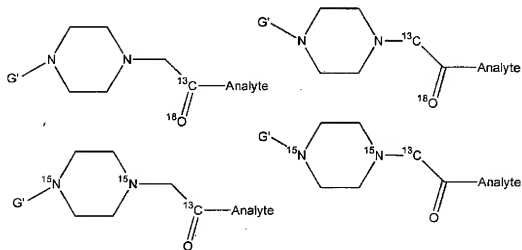
106. (Currently Amended and Withdrawn) The mixture of claim 104, wherein the mixture comprises ~~one~~ two or more labeled analytes of the formula:



107. (Currently Amended) The mixture of claim 104, wherein the mixture comprises ~~one~~ two or more labeled analytes of the formula:



108. (Currently Amended) The mixture of claim 104, wherein the mixture comprises ~~one~~ two or more labeled analytes of the formula:



wherein:

a) G' is an amino alkyl, hydroxy alkyl or thio alkyl group comprising one to eight carbon atoms which may optionally contain a heteroatom or a substituted or unsubstituted aryl group wherein the carbon atoms of the alkyl and aryl groups independently comprise linked hydrogen, deuterium and/or fluorine atoms;

b) each carbon of the heterocyclic ring has the formula CJ<sub>2</sub>, wherein each J is the same or different and is selected from the group consisting of: H, deuterium (D), R<sup>1</sup>, OR<sup>1</sup>, SR<sup>1</sup>, NHR<sup>1</sup>, N(R<sup>1</sup>)<sub>2</sub>, fluorine, chlorine, bromine and iodine; and

c) each R<sup>1</sup> is the same or different and is an alkyl group comprising one to eight carbon atoms which may optionally contain a heteroatom or a substituted or unsubstituted aryl group wherein the carbon atoms of the alkyl and aryl groups independently comprise linked hydrogen, deuterium and/or fluorine atoms.

109-110. (Canceled)